Space Weather Forecast

Issued on Thursday, 15 February 2024 at 13:08 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Quiet geomagnetic activity expected with Isolated M-flares likely and a slight chance X-flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low activity in the last 24 hours with only common classes flares recorded. There are seven numbered and two un-numbered sunspot regions on the visible disc, with the active region in the southwest persisting as the largest and most complex region, however some weakening of the peripheral trailing spots is evident on most recent imagery but this will likely become more difficult to analyse as it as it transits toward the western limb. In the northwest quadrant there are also two moderately sized bi-polar regions, however these have a simpler magnetic configuration, giving a lower potential for notable flares. Both these regions remain relatively stable with some slight decay now evident. A recently numbered spot group continues to rotate around the northeast limb, with a single moderate sized spot visible at present. Remaining spot region are small and magnetically simple.

No Earth-directed coronal mass ejections (CMEs) were observed in available imagery.

Solar Wind / Geomagnetic Activity: Solar winds were at slightly elevated levels for most of the period (400-450km/s), but fell to background levels (350-400km/s) from 15/0700 UTC. Interplanetary magnetic field (IMF) Bt, was at weak levels, but increased to moderate from around 14/2218 UTC until 15/0100 UTC. The north-south directed field, Bz, varied weakly. Geomagnetic activity was Quiet (Kp 0 to 1).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was above the Minor Radiation Storm level at the start of the period, before falling consistently below the S1 threshold after 14/2000 UTC.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate activity is expected with the likelihood of further isolated Moderate flares, and a slight chance of Strong flares. These most likely from the large region in the southwest.

Solar Wind / Geomagnetic Activity: There are no earth directed CMEs in the forecast.

Solar winds are currently at background levels and no significant coronal hole enhancements are expected, with coronal hole 97 likely too far south, and small coronal hole 99 likely too far north to influence solar winds at Earth. Two new coronal holes have developed near central limb but these are expected to be too small to have any major impact.

Quiet activity is expected, with a chance of isolated Unsettled intervals.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is now below the S1 Minor Radiation Storm, and on a slowly declining trend. Proton flux is expected to continue slowly declining through the period in the absence of further significant flare activity. However, there does remain an ongoing chance of further enhancements, most likely from the large sunspot region in the southwest, given any significant flares,

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	70	70	60	50
Very Active	R3 to R5 X	No	15	15	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	Yes	30	25	20	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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